

--96. The microactuator of Claim 57 wherein the first and second couplers comprise first and second unitary couplers.--

REMARKS

Applicant acknowledges the allowance of Claims 31-56 and 66-90.

Claims 57, 58, 61 and 62 have been rejected under 35 U.S.C. §102(e) as being anticipated by Allen (U.S. Patent No. 5,959,375). Claims 59 and 60 have been rejected under 35 U.S.C. §103 as being unpatentable over Allen in view of Lee et al. (U.S. Patent No. 5,780,948).

Reconsideration of these claims is respectfully requested.

Allen discloses a micromechanical reciprocating-tooth indexing apparatus. In FIG. 1 thereof, the indexing apparatus 10 comprises at least one actuator 12 connected to reciprocally drive a shuttle 14 through a connecting linkage 16. The shuttle 14 has one or more drive teeth 20 located at opposite ends of the shuttle 14 that are engageable with a plurality of indexing teeth 22 on the gear 18 to rotate the gear 18 in a particular direction (e.g. clockwise as shown in FIG. 1) about a hub 24 as the shuttle 14 moves back and forth. The indexing apparatus 10 in the example of FIG. 1 can be formed on a substrate 26, generally comprising silicon, using surface micromachining processes. Col. 3, lines 21-34.

Lee et al. disclose a vibratory structure, method for controlling natural frequency thereof and sensor and actuator adopting the vibratory structure. In FIG. 4 thereof, an inertial object 41 is supported by a first support end 47 via an elastic member 48, and finger-shaped moving electrodes 42-45 are formed integrally with the inertial object 41. The moving electrodes 42-45 are arranged in such a way that the end portions of the moving electrodes 42 to 45 are in a straight line. Col. 8, lines 21-26.

Claim 57, as amended, is patentable by calling for an electrostatic microactuator of the type called for therein comprising, among other things, a first coupler for connecting the first linear micromotor to the rotatable member and a second coupler for connecting the second micromotor to the rotatable member so as to utilize the substantially linear motion of the first and second micromotors for rotating the rotatable member about the axis of rotation. Contrary to the assertion of the Examiner, Allen does not disclose a first coupler for connecting the first linear micromotor to the rotatable member and a second coupler for connecting the second micromotor to the rotatable member. Webster's Ninth New Collegiate Dictionary defines the verb "connect" to include "to become joined." As noted above, drive teeth 20 and indexing teeth 22 of the Allen apparatus do not "connect" a linear micromotor to a rotatable member as called for in Claim 57.

Claims 58-62 and new Claim 96 depend from Claim 57 and are patentable for the same reasons as Claim 57 and by reason of the additional limitations called for therein. For example, Claim 60 is additionally patentable by providing that the first and second couplers comprise first

and second flexural couplers. As noted above, Lee et al. merely discloses an inertial object supported by a first support end 47 via an elastic member 48, finger-shaped moving electrodes 42-45 being formed integrally with the inertial object. There is no suggestion or disclosure in Allen or Lee et al. of utilizing a flexural coupler to connect a linear micromotor to a rotatable member. Claim 96 is additionally patentable by providing that the first and second couplers comprise first and second unitary couplers.

Claim 87 has been amended to make it more readable in view of Claim 86, from which it depends.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with Markings to Show Changes Made."

In view of the foregoing, it is respectfully submitted that the claims of record are allowable and that the application should be passed to issue. Should the Examiner believe that the application is not in a condition for allowance and that a telephone interview would help further prosecution of this case, the Examiner is requested to contact the undersigned attorney at the phone number below.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

The following claims have been amended as indicated:

Cancel Claims 25-30.

57. (Twice Amended) An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, first and second linear micromotors for imparting substantially linear motion and a first coupler for ~~securing~~connecting the first linear micromotor to the rotatable member and a second coupler for ~~securing~~connecting the second micromotor to the rotatable member so as to utilize the substantially linear motion of the first and second micromotors for rotating the rotatable member about the axis of rotation.

60. (Amended) The microactuator of Claim 57 wherein the first and second couplers comprise first and second ~~coupling springs~~flexural couplers.

87. (Amended) The device of Claim 86 wherein ~~the at least one flexure member includes first and second flexure members, each of the first and second flexure members having a first end portion coupled to the stationary structure at the axis of rotation and a second end portion coupled to the movable structure, the first and second flexure members extending~~extend substantially radially from the axis of rotation at an angle to each other.

Claim 96 has been added:

96. The microactuator of Claim 57 wherein the first and second couplers comprise first and second unitary couplers.